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# ORIGINAL ARTICLES

## ARTIFICIAL INFANT FEEDING BY MALT-SOUP.*

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In the feeding of babies who have been deprived of their proper and natural food—breast milk—one frequently meets with a condition in which the child is unable to digest and thrive on cow's milk diluted or modified in the usual way. In this type of case we are forced to various expedients, among which malt-soup takes a not inconsiderable place. These difficult feeding cases while seen in private practice are especially frequent in hospitals which treat babies and children, and it was while working with Dr. J. P. Cozer Griffith at the Children's Hospital in Philadelphia that most of my knowledge of malt-soup was collected. The paper is published at his suggestion.

It must be remembered that there is nothing new about malt-soup, and while we look to Keller[1] as the elaborator who put this form of feeding on a sound scientific basis, the different ingredients of malt-soup had been used before as early as 1865 by Liebig, and even previously to this. Malt-soup has at times been a very popular part of the infant's dietary, and has been widely used in most European countries.

It may be asked if malt-soup is a rational food and is justified scientifically. In order to prove that this form of feeding is both rational and scientific I shall try to present sufficient evidence.

The facts brought out are in a large part gathered from a careful study of Keller's monograph, from later writings, and from our own observations.

Children who suffer from enteritis have an increase in the acid products of metabolism, and a lowered capacity of the body for the oxidization of acids. The alkali of the body combining with the increase of acid is excreted and lost from the body. Alkali must be added to the food to make up this loss and to neutralize the acid, and this is exactly what we do with malt-soup. We usually add this alkali as potassium carbonate because potassium is the form of salt found in the solid parts of the human body. Thus we have a good reason for the addition of potassium carbonate.

Why do we use malt-extract, in which the main ingredient is maltose, with a small amount of dextrin and other constituents? In the first place, the sugar is here in a further state of digestion than either cane-sugar or milk-sugar. Furthermore malt-sugar stimulates digestion more than do the other sugars, and is not as prone to fermentation as these. The most important reason lies in the fact that maltose does not increase the acid products of metabolism even when given in much larger amounts than other sugars. This explains why we use malt-extract.

Why do we use starch? We formerly believed that young babies could not digest starch, but we now know by observations of Hess[2] that even many new-born babies have amylase (the starch splitting ferment) in the pancreatic secretion.

By testing infants' stools we find that about seventy per cent of children can digest moderate quantities of starch[3]. We have confirmed this at the Children's Hospital. Starch does not readily undergo acid fer-

*Read by invitation before the Volusia County Medical Society at Daytona, February, 1916.

mentation[4], protects the intestinal mucous membranes, and spreads the process of digestion over a longer length of intestine.

Malt-soup is a method of modifying cow's milk by the addition of malt-extract (with potassium carbonate), and starch in the form of flour. There are three kinds of malt-extract on the market which may be used. These have potassium carbonate added in proper percentage, and are called "Malt Soup Extracts." They are made by Loeflund, Borcherdt, and the Maltine Company. Almost any malt-extract may be used, provided it is non-diastatic, i. e., does not convert starch. This may be accomplished by heating it almost to boiling and keeping it there for several minutes. Potassium carbonate must also be added in the proportion of seven grains to the ounce of extract. Of course in the malt-soup extracts the starch-splitting ferment is already destroyed and the potassium carbonate has been added.

In the preparation of the soup itself, the amount of flour ordered should be mixed with a small amount of water to make a paste, the rest of the water ordered is added, the product is boiled for twenty minutes. Then the amount of malt-extract required is mixed with this starch-and-water solution, constantly stirring. The milk ordered should then be added and the whole brought to a boil again. Lastly sufficient additional water is supplied to bring up the amount lost in boiling.

In feeding it is well to have formulas of several different strength in order that one may start with a weak mixture and gradually increase. The formulas which are given below are figured out on the basis of twenty ounces. However, if one is using more for the twenty-four hours they may be readily increased by multiplication. For example, if one needs thirty ounces the amount of each ingredient to be employed in the twenty-ounce basis is multiplied by one and one-half, or if forty ounces is ordered, multiply by two.

You will notice also that the formulas show the percentages of fat, carbohydrates and protein. These have been carefully estimated for the malt-extract we used at the Children's Hospital. The percentages would be practically the same if any malt-extract were used, as most good extracts are very much the same.

As to the variety of flour, any good wheat-flour or barley-flour may be used.

*Formula A*:
½ ounce wheat flour.
10 ounces skimmed milk.
10 ounces water.
1 ounce malt extract.
Fat, 0.2%; carbohydrates, 7.5% (of which 2% is starch); protein, 2.2%.

*Formula B*:
½ ounce wheat flour.
5 ounces skimmed milk.
5 ounces whole milk.
10 ounces water.
1 ounce malt extract.
Fat, 1%; carbohydrates, 7.5% (of which 2% is starch); protein, 2.2%.

*Formula C*:
½ ounce wheat flour.
10 ounces whole milk.
10 ounces water.
1 ounce malt extract.
Fat, 0.2%; carbohydrates, 7.5% (of which 2% is starch); protein, 2.2%.

*Formula D*:
1 ounce wheat flour.
10 ounces whole milk.
10 ounces water.
1½ ounces malt extract.
Fat, 0.2%; carbohydrates, 11% (of which 3.8% is starch); protein, 2.6%.

*Formula E*:
1½ ounces wheat flour.
10 ounces whole milk.
10 ounces water.
1¼ ounces malt extract.
Fat, 0.2%; carbohydrates, 14% (of which 5.7% is starch; protein, 2.9%.

In these formulæ the amount of flour is by weight, and the amount of malt-extract is by volume.

It is not always necessary to begin with the lower formulas, and indeed it is often better to start with formula *C*, *D* or *E*. They should be fed every three or four hours. The amount of each feeding varies according to age and weight. Preceding the employment of the soup, the child should be given a purge, and perhaps an irrigation of the intestines; and if in condition to tolerate it a short period of starvation—six to twelve hours—should be instituted.

In what kind of cases shall we use malt-soup? It is not a panacea and will not agree with every child. The typical case in which it is of greatest value is in the child who will not thrive on reasonable modification of the fat, sugar and protein of cow's milk. Some children will not gain on a weak mixture, and yet will vomit and have bad stools if the mixture is increased in strength. They are often the so-called "marasmus" or infantile atrophy cases. These babies will frequently digest the large amount of sugar in malt-soup, and can take more of the fat of cow's milk in malt-soup than in any other way.

A case which does well will show no vomiting; have from two to four rather large smooth stools a day; and should gain in weight steadily. If the baby shows vomiting which is not controlled by reducing the amount of food given, or diminishing the strength of the formula, has diarrhœa, and shows a starch reaction in the stool, he will probably not gain weight, and after a fair trial should be taken off this form of feeding.

What cases do not get well on malt-soup? Babies under four months; premature babies; vomiting cases; cases with much diarrhœa or considerable mucus in the stools, in our experience do not as a rule thrive. There are many exceptions even here, and malt-soup may work wonders in some of these cases.

In changing from malt-soup to ordinary milk-mixtures one must expect an initial loss of weight because of the removal of the large percentage of carbohydrates. The most satisfactory procedure is gradually to add a feeding or two daily of the milk-mixture having a somewhat lower percent of fat and protein than the malt-soup mixture, with a carbohydrate raised to seven per cent by the addition of dextri-maltose and a barley-water diluent. In this way the number of malt-soup feedings can be slowly reduced. There is no objection to keeping babies on malt-soup for several weeks, and they may even thrive for months.

A word about the stools. Owing to the large amount of carbohydrates, the child getting malt-soup usually has several stools a day, although more than four should not occur if the patient is doing well. They are somewhat bulky and firm, and dark-brown in color. Mucus should not be present. The stools may at times, however, show a trace of mucus, and yet the patient do well. At least once every day a test for starch should be made. This is easily done by dropping a weak solution of iodine on the stool, and observing whether a blue reaction occurs.

**Examples of Favorable Cases**

*Case 1.* Age 5½ months.

On admission had pneumonia. Had been breast-fed for two months, and since then on cow's milk mixtures. After convalescence from his pneumonia he was on milk mixtures (fat, 1.5 per cent; sugar, 6 per cent; protein, 1.5 per cent, and fat 2 per cent; sugar, 6 per cent; protein, 1.5 per cent) for eight days, during which time he lost twelve ounces; had daily one or two greenish yellow, loose, smooth, offensive stools with much mucus; no vomiting; took thirty-four to thirty-eight ounces a day.

On malt-soup eleven days; during which time he gained seventeen ounces; had daily two brown, loose, smooth stools, with very little mucus; no vomiting; took thirty-four to thirty-eight ounces a day.

*Case 2.* Age 10 months.

Admitted for intestinal indigestion. Had been breast-fed three weeks, condensed milk ten weeks; had milk mixtures fifteen weeks. Before malt-soup had casein-flour milk (fat, 0.3 per cent; sugar, 5.25 per cent; protein, 2.75 per cent) for one week; during which time the weight was stationary; had daily three to five greenish yellow, loose, smooth stools, with some mucus; no vomiting; took thirty-one to fifty-six ounces a day.

On malt-soup twenty-one days; during which time he gained thirty-three ounces;

had daily one to three brown, loose, smooth stools; no vomiting; took fifty-six ounces a day.

*Case 3.* Age 3¼ months.

Admitted for intestinal indigestion. Had been breast-fed for three months when the supply of milk ceased. Before malt-soup had casein-flour milk and a (fat, 2 per cent; sugar, 6 per cent; protein, 1.5 per cent) mixture for twenty-two days; during which time he lost sixteen ounces; had daily one to three yellow, soft, granular stools; no vomiting; took twenty to twenty-eight ounces a day.

On malt-soup sixteen days; during which time he gained thirty ounces; had daily three to four brownish yellow, loose, smooth stools; had occasional vomiting; took thirty-five ounces a day.

*Case 4.* Age 15 months.

Admitted for chronic intestinal indigestion. Had been breast-fed one month; milk-mixtures ten months. Before malt-soup had been on different milk-mixtures, and casein-flour milk for four months; during which time he gained sixteen ounces; had daily three to four yellow, loose, smooth to lumpy, offensive stools with some mucus; no vomiting; took fifty-six ounces a day.

On malt-soup nineteen days; during which time he gained thirty-eight ounces; had daily three to four yellowish brown, loose to slightly lumpy stools, with at times mucus; no vomiting; took sixty-three ounces a day.

*Case 5.* Age 5 months.

Admitted for chronic gastro-intestinal indigestion. Had been breast-fed two months; milk-mixture one and a half months. Before malt-soup had casein-flour milk-mixtures, larosan for forty-eight days; during which time he lost three ounces; had daily three greenish yellow, loose, lumpy stools; no vomiting; took twenty-five to forty ounces a day.

On malt-soup twelve days; during which time he gained twenty ounces; had daily two to four yellow, loose, smooth stools; no vomiting; took forty-four ounces a day.

**Examples of Unfavorable Cases**

*Case 1.* Age two months.

Admitted for chronic enteritis and infantile atrophy. Had been on some kind of milk-mixture; no other feeding history obtainable. Before malt-soup had been given milk-mixtures, buttermilk and Buco for forty-nine days; during which time he gained twenty-three ounces; had daily three greenish yellow, loose, smooth to lumpy stools with considerable mucus; no vomiting; took sixteen to twenty-four ounces a day.

On malt-soup twenty-one days; during which time he gained only six ounces; had three to four yellowish brown, loose stools with considerable mucus, and later a starch reaction to iodine; no vomiting; took thirty ounces a day.

After malt-soup was given casein-flour milk, had better stools, and gained in weight.

This baby was unable to digest the starch. Apparently the sugar content was not too high as there was no vomiting. It might have been possible to decrease the quantity of starch somewhat, and thus have kept the patient on malt-soup.

*Case 2.* Age 1¼ months.

Admitted for regulation of feeding. Premature baby. Had been fed on peptonized milk-mixtures. Before malt-soup had been given milk-mixtures in addition to diluted breast-milk for fourteen days; during which time he gained three ounces; had daily five to seven brownish yellow, loose lumpy stools with much mucus; no vomiting; took twenty ounces a day.

On malt-soup twenty days; during which time he gained five ounces; had daily three to six greenish yellow to greenish brown, loose, smooth stools, with considerable mucus, and later a strong iodine reaction; had occasional vomiting; took twenty to twenty-five ounces a day.

After malt-soup was given breast-milk, but died in a week.

This child could not digest sufficient starch. At times also the malt-soup was not

retained. The stools were frequent and it is probable that the sugar content of the food was too high for this patient.

*Case 3.* Age 1½ months.

Admitted for infantile atrophy. A seven months premature baby. Had been entirely breast-fed two weeks. Before malt-soup had been given breast-milk in addition to milk-mixtures and casein-flour milk for twenty-eight days; during which time he lost three ounces; had daily one to four greenish yellow, smooth to lumpy stools; occasional vomiting; took twenty to twenty-five ounces daily.

On malt-soup three days; during which time he lost five ounces; had greenish lumpy stools with much mucus; vomited a great deal; took twenty ounces a day.

After malt-soup was stopped he was again given breast-milk, egg-whey and buttermilk. Died eight days later.

This patient could not retain malt-soup, probably breast because of its high sugar content.

*Case 4.* Age 4 months.

Admitted for regulation of feeding. Had been breast-fed for four weeks, then on milk mixtures. Before malt-soup had been given (fat, 1 per cent; sugar, 6 per cent; protein, 1.5 per cent) mixture for five days; during which time he lost seven ounces; had daily two to three greenish yellow, loose, lumpy stools with much mucus; no vomiting; took twenty-eight ounces a day.

On malt-soup thirteen days; during which time he gained eight ounces; had daily two to five brownish, loose, smooth stools, which were much improved, but later showed a strong starch reaction; vomited; took twenty-eight to forty-two ounces a day.

Another child showing starch indigestion.

I have tried here to show that malt-soup is a reasonable food and to point out that in our clinical experience it is often useful, and has apparently saved life after other forms of feeding failed. I have tried to show that it is not difficult to prepare; how it is to be used, and when to try it.

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## IS PRESENT KNOWLEDGE SUFFICIENT TO CURE AND PREVENT TUBERCULOSIS?*

J. M. MASTERS, M. D.,
Port Orange, Fla.

This is a question to which the world is imploringly seeking an answer from the medical profession. What response can be given? Must it be one of disappointment or one of cheer thrilling the laity with confidence in the ability of the medical world to cope with and vanquish this dreaded destroyer of human life? I fear that the profession is yet not fully aware of the joyful confident answer that all the facts warrant it in proclaiming to the people. What dread, what grief, want and suffering could be dissipated if only the united voice of the medical profession could be enlisted in a powerful and harmonious chorus that would carry the music of truth around the world? That sufficient is known both to cure and prevent the further spread of tuberculosis, I wish to state with all the emphasis that experience and demonstrated facts can add to the declaration. But very few cases of consumption need die. It is within the power of the profession and is its imperative duty to stop the ravages of this disease. What, then, is standing in the way of a more general application of the knowledge that would cure the sick and shield the well from this malady? I shall endeavor to present the difficulties that must be overcome as they have been brought to my attention through the work of a number of years. That so many continue to contract and die of tuberculosis, is partly the fault of physicians and

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largely the fault of the people. Let us first, if we can, learn wherein the profession is failing to do all that is possible in combating this disease. I feel sure that most all incipient, or even early stage cases, can be cured; not more than two to five per cent need die. If this statement is accepted as within the bounds of truth, then we must all recognize the fact that much is being left undone that should be done to save the lives of these patients.

Primarily the responsibility of all medical matters for the welfare of the public rests with the medical profession. In this particular disease the general practitioner must come to realize the great responsibility resting upon him; all cases of tuberculosis are first in his hands and upon his judgment and advice depends the life of the patient. The fact that in its incipiency the disease is curable makes an early diagnosis of paramount importance. The well-known prevalence of the disease should stimulate every practitioner to familiarize himself with methods of diagnosis, and in cases of doubt seek the assistance of those able to help. The failure of early recognition of the disease being so common makes it the first fault of the profession that must be corrected.

Another mistake entertained by many doctors, as well as by the laity, is that some specific medicine must be discovered for the cure of consumption, and that until this is found there is little or no use to attempt more than alleviate the suffering of the patient. Not long since a physician stated to me that he had been experimenting on patients for a long time, and he had never been able to keep one alive more than a year. I wish to emphatically state that the treatment and cure of tuberculosis does not depend on remedies but on methods. The patient must be so situated that his vital powers can have a free hand in combating the infection. The conditions under which the disease developed must be removed, and in most cases this means that the patient must be removed from the conditions. To avoid detail the patient must be placed under absolute control and care so that all habits of living are corrected and made the best. Responsibility, worry, work, disturbances of every nature must be eliminated. This brings us to the question of where and how can conditions that will permit of treatment and cure be secured, as the administration of potent remedies, except under perfect conditions, is unjustifiable. Only in very exceptional instances can all requirements for successful conduct of cases be supplied at the patient's home; the necessary discipline and obedience of the patient cannot be enforced, and the careful medical attention and observation which is indispensable is often difficult or impossible to attain. Every physician is familiar with the insurmountable difficulties which are encountered in attempting to care for patients in their homes. The profession and the public are slowly learning that institutions where these cases can be congregated and placed under complete supervision must be provided.

Better training in diagnosis for the family physician, the encouragement of Sanatoria, both public and private, candid and positive advice to patients early in the disease are the principal points that demand the co-operation of the profession. There are not, perhaps, more than ten per cent of tubercular patients that can avail themselves of the advantages of private institutions; so it becomes the duty of the profession to educate the people of the necessity for public Sanatoria to care for this large class, and also assist such legislation as will enable counties, or an association of several counties, to make these provisions. Until these things are done the death rate from tuberculosis will remain about the same.

The medical profession must also urge upon the various states the enactment of more rigid laws for enforcing preventiv measures. The attitude of the public toward this disease is one of fear, and tubercular

subjects are so shunned even by friends that most patients endeavor to conceal their trouble. To avoid exposure they refuse to observe any precautionary measures necessary to prevent the spread of the disease. The public must be taught that simple contact with tubercular people is not dangerous, but that association with those who refuse to observe rules for prevention to avoid publicity is the source of much infection.

What has been accomplished in the state of Victoria, Australia, where it is claimed no active case of tuberculosis now exists, should be an object lesson for every country. Under stringent laws firmly enforced the disease has been practically eliminated. One of the regulations is, "Any one reporting a case of tuberculosis is paid $2.50." This has secured very thorough reporting of cases. As soon as a case is reported an investigator calls and the patient is immediately sent to a Sanitarium. The law makes a few exceptions. If the patient is able to, and can convince the authorities that he will carry out all rules for the protection of the people, he is allowed to remain at home. He is furnished a card on which are very plain rules both as to sanitation and management of treatment. The inspector often visits these cases, and any violation of any rule sends the patient at once without formality to the Sanitarium. So that almost every case is treated in an institution, and having been sent there in the beginning almost every case recovers. In the United States tuberculosis Sanatoria are looked upon by the majority of the people as a pest house and a place where people in the last stages of consumption go to die. The public fails to understand the real character of a properly conducted Sanatorium. Many think of these institutions as places of gloom, distress, loneliness, homesickness, or isolation where misery and infection permeate the very air. This fear of Sanatoria is yearly causing the loss of thousands of lives that the Sanatoria could have saved. A rather illustrious example of this is that of the noted writer, Robert Louis Stevenson. No argument could ever overcome his prejudice to a Sanatorium; friends that had recovered in institutions could not prevail on him to go. He seemed to abhor the very name, and like many others are doing, he went from place to place thinking change of climate alone would cure him, and at last died on the island of Samoa, where he was buried. These examples are almost innumerable and illustrate one of the great faults of the public that must be corrected. Another obstacle in the way of prevention is our public schools. Fifteen years ago I advocated the plan that would require every child to be carefully examined before entering school. In a few cities this has since been inaugurated. It should be universally adopted. Not only would the danger of spreading the disease in the school be avoided, but those found with the trouble could be early placed under control and cured.

Another far-reaching evil is the sick tourist. After he has perhaps stubbornly refused the advice of his physician, and has become so advanced with the disease that death is knocking at the door, he begins to travel, going from place to place, making every possible effort to hide his true condition, studiously avoiding all precautions, stopping in every hotel and boarding house that will accept him, and most of them do, and so becomes the most prolific distributor of tubercle bacilli. The traveling consumptive should in some way be controlled. This is a question which our beautiful state may be called on to deal with. Other sections and some cities are confronted with the same problem. We already know sufficient to check the spreading of the disease; we know enough to cure it; as a profession let us work together to this end. There could be no greater satisfaction to any physician than to know he has had some part in conquering one of man's greatest foes.

# THE EARLY DIAGNOSIS OF TUBERCULOSIS.*

GUSTAV BAERECKE, M. D.,
DeLand, Fla.

In recent meetings of this society, Dr. Masters has brought to our notice with extreme care and accuracy the early symptoms even before the signs of tuberculosis, especially where only the quality and tone of the vocalized effort for removing mucus from the throat was the first indication. Dr. Ingram today has limited his remarks to the special organs that come under his domain, giving us a clear exposition of the tubercular processes. I will endeavor to recall to our minds from a few selected cases of personal observation, some other signs and symptoms that led to the recognition of tubercular infection in other parts of the body, some to timely recognition—and some too late. Not to be didactic, I will give these cases in short histories, leaving them to your consideration and criticism.

*Case 1.* A young woman, married, 26 years, with negative family and personal history, presented herself in a run-down condition, tired, listless and apt to tears. She had had a child which she lost at the age of ten months, a year before. The baby was robust until a few days before death.

I went carefully into her daily habits—they were good, slept outdoors, no cough, no pains except occasionally in the right iliac fossa, menses were becoming irregular, somewhat scanty. I gave her a thermometer to keep a record. I examined the reflexes, pupillary, knees, ankle clonus, Babinski, none exaggerated or defective. The abdomen was smooth, a bit tender on deep pressure in the right fossa and I imagined I could feel a slight mass. Vaginal examination showed the generative organs normal, good position, but again upon deep pressure in the right fossa I struck a slight rounded mass, or thought I did, and it was tender. I went into the history of the baby's death, supposedly a volvulus or some abdominal condition, but learned of distinct signs of meningitis—possibly tubercular. Urine negative. A sub-cutaneous tuberculin test was given. She reported a rise to 101.3, and had a positive reaction on the arm. I treated her with von Ruck's vaccine. She ran a temperature for a month, then convalescence was uninterrupted, the tender areas disappeared, she gained in health, became stronger, overcame the great depression and nervousness, and is now the proud mother of another fine child. Diagnosis, tubercular adenitis—iliac fossa—secondary most probably to some unfound primary infection.

*Case 2.* A young man, very studious, a bookworm, contracted a case of gonorrhea. This was treated, cleared up and he passed clear urine. One day he had a slight hematuria. He again injected silver iodide, in quince seed emulsion as for his gonorrhea. However, in spite of treatment, micturition became more frequent, slight pains "somewhere up inside" not in the urethra and again the urine became bloody and increasingly so. I found no gonococci but staining for tubercle bacilli found them. I then did a cystoscopic, believing I would find a tubercular ureter with its characteristic dribble of pus and ulceration around the mouth. Instead I found a papillomatous growth on one side of the trigone, ulcerated around the edge. He rapidly declined in health, and before death the papilloma almost blocked the urethra. Microscopic examination showed tubercular ulcers of infiltration.

*Case 3.* A little boy five years old lost his interest in play and seemed easily tired. He would lie down with the right leg flexed. Fever developed with slight tenderness in the right iliac fossa and pain at the navel. Diagnosis of appendicitis made in one of our large cities, and operation performed—a normal appendix removed. During convalescence and the rest in bed he had no fever, but pain persisted, and upon his exercising, the fever returned. Examined by several physicians who diagnosed several

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diseases, including pulmonary tuberculosis. An osteopath diagnosed tuberculosis of the spine from the navel pain. X-ray found lung clear but slight destruction of intervertebral cartilage in thorax. Child put in plaster jacket and given von Ruck's vaccine, when he came under my care. The fever left, he gained rapidly in weight and spirits. Last summer he walked all day in jacket and brace including head and neck brace, and slept at night on a frame. Last X-ray showed good healing.

*Case 4.* A little girl of seven years, syphilitic history in father who was treated and pronounced cured, developed tendency to lag in her play, to lie down, especially on one side, irritable, fitful in her desires, headache, loss of appetite. Finally she became feverish, stayed in bed, moaning nearly continuously, and had pain in back of head, anorexia and started to vomit. The child had been treated slightly for malaria and biliousness. I suspected meningitis and noticed rigidity, Kernig's sign, tender, scaphoid abdomen, persistent vomiting and disturbance of pupillary reflexes. I learned at that time of the syphilitic history, but her teeth were good, and the mother had had no miscarriages. Blood count gave low leucocyte, which contraindicated specific meningitis but was suggestive of tuberculosis. The chest seemed negative. Spinal puncture demonstrated tubercle bacilli. Death in twenty days from first symptoms, tubercular meningitis.

*Case 5.* A woman, well nourished, negative family and personal history, mother of three healthy children, comes with ulceration of one nipple, strikingly like Paget's carcinoma. She had noticed some lumps around the nipple for several months, and the skin was adherent. She steadily gained in weight, no axillary involvement. Microscopic examination of a frozen section while hesitating about a radical operation proved the slight mass to be tubercular. The surgeon was hard to convince but no recurrence in three years.

*Case 6.* A rather well developed married woman, a physician's wife, complained of frequent urination with sediment of pus. Suspecting a latent gonorrhea, I examined smears and stained the sediment but found none. There was some slight unilateral pain in the hypochondriac region at times and kidney was barely palpable. She had been advised to have fixation of a floating kidney. Further examination did not show acidfast bacilli though there were bacilli that stained red and retained the stain temporarily. This was a catheterized specimen so could hardly be smegma bacilli. Not satisfied a few drops of urine were injected intraperitoneally in a guinea pig. In ten days the pig was killed and found tuberculous at site of injection—liver, spleen, lungs, etc. Tuberculosis of kidney—possibly bovine?

*Case 7.* This is the last case and possibly the most interesting. An athletic young married man came with a swollen, tender, soft testicle and history of slipping on the bar of his bicycle a few days before, injuring his testicle. I advised hot applications, later absorbent ointments. The testicle became fairly normal. In four months a recurrence of swelling and pain easily reduced but testicle a bit larger; in six months after injury I opened a large hydrocele, found the testicle very large, hard and nodular. I examined the fluid for tubercle bacilli but found none. I then began to question his truthfulness of a pure life and as the testicle grew larger told him it must come out, stating it was probably tuberculosis, possibly a gumma or might be sarcoma, though the cord was thickened but no glands involved. Upon removal high up, the glands were examined carefully, no enlargement found. We felt confident that the growth was benign but stained sections showed small round cell sarcoma. In two years no recurrence—though one may expect that almost as a certainty in the glands or liver.

Through these few cases, which to me

were very interesting because of the confusing symptoms or lack of symptoms and yet marked involvement, I have no doubt recalled to all here similar or even more complex forms of tuberculosis and only added a few more items to that long list of warnings that the Great White Plague strikes all classes and types of men in any form simulating many other diseases and giving but slight notice of its ravages.

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## CERVICAL LACERATION.*

DAVIS FORSTER, M. D.,
Hawks Park, Fla.

A recent discussion of a paper led to the expression of opinions that were different as to effects and results of cervical lacerations, and of the advisability of repairing the same. Therefore, a review of the facts will not be out of place at this time, though the subject is an old one, and yet it might be well for us to go over well-trodden ground again, lest we forget.

The first operation of hystero-trachelorrhaphy was performed by Thomas Addis Emmett of New York and was named by Dudley of Chicago. Emmett's operation followed upon the era of womb splitting inaugurated by his predecessors. The investigations of Emmett were of great value to the profession, as he first demonstrated by catching the denuded cervical lips with a hook and bringing them together, that there was a laceration present and not an erosion. Previous to that event the everted surfaces of the cervix had been treated as a pathological entity, cicatricial ectropion. Emmett's operation demonstrated itself of so marked benefit to the patient that it became a fad, and like all fads, was probably overworked. The operation, however, was founded on firm surgical grounds and the technique of Emmett was so perfected that we use the same with but little alteration to this day.

Cervical laceration is caused nearly always by the passage of the fœtus through the cervical canal, sometimes by the rapid dilation due to curettage. The laceration may be unilateral, bilateral or stellate, is more often on the left side, because the occiput impinges on that side more frequently, causing greater distention. We cannot wonder at the frequency with which a tear takes place when we remember that that canal normally one-eighth of an inch in diameter has to dilate to allow the passage of a body with a diameter of more than four inches.

The uterus is a muscular body with longitudinal and circular fibers. It weighs after being emptied at term about two pounds. When the cervix is torn the point of insertion of the longitudinal muscle fibers is interrupted and their contractability is interfered with. The uterus is unable to involute to its normal size. The organ becomes flabby, loose, boggy, and infiltrated with serum. The mucus membrane is congested and menstrual flow exaggerated and deranged. Through loss of tone the uterus bends at the junction of the cervix and body. The cervix, with lips everted by muscular contraction, is forced down on the floor of the vagina by the overweight of the organ and by pressure the lips are further separated. Lined with columnar, ciliated epithelium, with glands secreting an alkaline mucus, it is forced to remain in the acid secretions of the vagina constantly irritated by them. The glands of Naboth become closed and form cysts which in time riddle the cervix with a cystic degeneration.

The uterus swinging normally in its peritoneal hammock, becomes overweighted and drops backward and further pressed by intra-abdominal force, swings in the arc until the fundus passes the promontory of the sacrum.

Again, the lacerated cervix serves as an open door through which infection may creep in by the continuity of mucosa through nature's mechanical gateway, the external os, or through the lymphatics with

*Read before the Volusia County Medical Society at Port Orange, April, 1915.

which the uterus is so rich. Invasion by continuity of mucosa is, broadly speaking, by the gonococcus of Neisser, with subsequent involvement of the endometrium, the Fallopian tubes and the peritoneum, while invasion through the lymphatics is more often of septic origin, the staphylococcus and streptococcus pyogenes. This invasion of foreign media of irritation takes place whether the tear be sufficient to involve the cellular tissue surrounding the uterus, or if it be confined within the area of the canal itself. Granted the bacterial invasion of the organ, followed by nature's effort to limit the area of infection by hurrying to the parts a leucocyte army to build a plastic wall, we have the cardinal symptoms of pain, heat, redness, swelling and increased secretion, in short, inflammation, and the retroverted uterus is bound by plasma exudations in its unnatural position, where it lies with twisted vessels adding to its congestion.

This infection with its consequent inflammation may not take place for a variable time following the laceration and subinvolution and is in no sense to be considered as a cause of the subinvolution. This subinvolution extends not only to the uterus but to the round ligaments, the tubes and surrounding tissues.

As regards prophylaxis we should abstain from applying forceps until the cervix is fully dilated, should not give ergot until the uterus is empty, should refrain from puncturing the amniotic sac, or from making pressure upon the abdomen when the child is in the uterus.

Sometimes when the surfaces are approximated and kept clean, these cervical tears will heal by primary union, if not subjected to muscular contraction; tears on the anterior and the posterior portion of the uterus are not subjected to muscular contraction and nature attends to these so well that the gynecologist finds the chief place for his work on the lateral parts of the uterus, which are separated by muscular contraction. If unable to heal primarily nature attempts a secondary repair by granulation, but where the squamous epithelium of the vaginal portion meets the columnar epithelium of the canal, a cicatricial plug is formed which prevents further return to the normal. This scar plug by pressure on nerve endings is responsible for a variable number of symptoms, which are relieved by the removal of scar tissue. Among these may be numbered persistent headache and backache and intractable vomiting.

In repair of the cervix the patient is put to bed the day before the operation, given a saline laxative the night before, an enema the morning of the operation and a bichloride douche of 1-2000. The vulva is shaved and covered with an antiseptic wet pack. The patient is brought to the operating room where under general anesthesia the vagina and cervix are washed with green soap and bichloride solution of 1-2000. The patient is placed in the lithotomy position with the perineum retracted with a Jackson or Edebohl speculum. Each lip or cervix is caught with a tenaculum forcep which gives control of the uterus. The area to be denuded is outlined with scalpel and tissue removed with scissors. Care must be taken to remove all scar tissue, for scar tissue in the wound would prevent some of the good results looked for from the operation. A suture of No. 2 ten-day chromicized catgut is passed from vaginal surface of lip to the cervical canal and back through the other lip. About three sutures on each side are used to approximate as needed. Having not denuded the channel of the canal, we see that it is able to admit a sound but do not pack it with gauze. Keep the vagina sterile and use a douche if discharge shows at vulva. Let the patient up on the tenth day.

The results are more satisfactory in proportion to the severity of this operation than any which the gynecologist is called upon to perform. Following the operation the first menstruation will nearly approach a

hemorrhage, demonstrating the returning contractibility of the uterus, its reduction in size and its return to normal condition.

*The Shelter Sanitorium.*

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## COLLES FRACTURE.*

JOHN REEVES, M. D.,
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Under this term are included fractures of the radius near the wrist which, while differing from each other in many respects, have, in common, a characteristic deformity, and often a certain difficulty in making reduction.

Next after the ribs, this fracture is most frequently seen; as far as my own experience goes, it is, by far, the most frequent of all fractures, and in connection with it is the remarkable fact that until about a hundred years ago it was always considered and treated as a dislocation (backward) of the wrist, which it much resembles.

Ponteau is the first author to describe it as a fracture; his view of the injury did not appear to commend itself to his successors at once, as for thirty years after the publication of his views only an occasional mention is made of even the possibility of such a lesion, and the common injury was still called a dislocation.

Mr. Colles published his brief but accurate account of the fracture in 1814. A short period of doubt followed, and then about 1830, the fact was universally accepted, and the second stage, that of the discussion of details, which has lasted almost to the present time, was entered upon.

Before proceeding to describe this fracture, it will be necessary to say a few words in regard to the normal anatomy of the wrist joint and in order to be brief only the points actually concerned in this fracture will be noticed.

The bones which enter into the construction of the wrist joint are the radius, the lower expanded portion of it, the scaphoid, and semilunar; the ulna, while not strictly one of the bones at the joint, is right there, however, as we often notice to our sorrow.

The ligaments are the anterior and posterior radio-ulnar, anterior and posterior ligament, annular, external lateral, and internal lateral. The wrist joint is also covered, in front, by the flexor, and behind by the extensor tendons of the hand.

The muscles and tendons are the supinator longus, which arises from the condyloid ridge of the humerus, and is inserted into the base of the styloid process of the radius, the pronator quadratus which arises from the lower fourth of the anterior surface of the ulna, and is inserted into the lower fourth of the anterior surface and external border of the shaft of the radius; besides these are the flexors, and extensors of the thumb, and carpus.

The etiology, or cause, of this fracture, we are told by most textbooks, is a fall on the hyperextended hand, the weight of the body being received upon the carpus and thus transmitted to the radius. But it is more than that; it is the weight of the body plus the velocity at which the body was going. One may drop the weight of a hammer on the head of a nail, but without adding the velocity you get no result.

The fracture usually occurs from one-half to once inch above the articular surface of the radius and is transverse or oblique, according to the amount and direction of the force. In young subjects the solution of continuity may occur at the junction of the epiphysis with the rest of the bone.

At this point I want to impress upon you the fact, which is now undoubted, that while Colles fracture is a fracture of the lower end of the radius, and is always so defined, it is certainly something more than that—for whoever saw this fracture without there being something wrong with the ulna? I never did; it is either broken above the styloid, or the styloid is detached from the rest of the bone, or it is dislocated and forced (by the action of the pronator quadratus,

*Read before the Volusia County Medical Society at DeLand, June, 1915.

and the force of the fall) downward and inward toward the palmar aspect of the wrist. We may be certain that in nine cases out of ten we have the ulna to deal with as well as the radius, and it is a very important point to know just where "it's at."

The symptoms of this fracture are marked and characteristic, but crepitus and abnormal mobility are not so well marked as in many other fractures.

The displacement is very considerable and bears some resemblance to dislocation of the carpus backwards, from which it should be carefully distinguished.

The lower fragment is drawn upwards and backwards behind the upper fragment by the combined actions of the supinator longus and the flexors and extensors of the thumb and carpus, producing a well marked prominence on the back of the wrist, with a sharp depression above it; also the radial side of the forearm is shortened, which shortening is plainly caused by the action of the supinator longus, which is inserted into the base of the styloid process of the radius. This is shown by the fact that the radial styloid, which is normally one-quarter of an inch lower (nearer the hand) than the ulnar styloid, is in this fracture drawn up even with, sometimes higher than, the ulnar styloid. This fact would be a good diagnostic point if the ulnar styloid were a fixed point, which it is not.

The lower end of the upper fragment projects forward and downward, causing a projection on the anterior surface of the forearm immediately above the carpus. This projection is not only the lower end of the upper fragment, but is also in part the flexor tendons which are thrust forward by it.

The injury to the ligaments already mentioned is never exactly the same in amount in any two fractures, depending entirely upon the position of the hand at the time plus the force of the fall.

It is safe to say that they are never all ruptured. The radio-ulnar ligaments, anterior and posterior often suffer most from the fact that the ulna is apt to go on after the rest of the hand stops. As I have said before, you never know just exactly what the ulna is going to do.

The most prominent diagnostic features are: First, the prominence of the lower fragment on the dorsum of the wrist with the crease or depression above it. Second the prominence of the lower end of the upper fragment on the palmar surface. Third, the fact that the styloid of the radius is up to or above the level of the styloid of the ulna (always supposing the ulna to be a fixed point) is also diagnostic but can be seldom utilized. Fourth, the hand being drawn to the radial side, and the radial side of the arm being shorter than in normal condition.

The general appearance and position of the hand and wrist is also a strong diagnostic point, and is aptly compared by Velpcan to the outline of the silver fork; of course, if there is no displacement, you do not get this perfectly.

The only other lesion of the wrist joint at all resembling this is (as I have before remarked) "dislocation of the carpus backward." The most important diagnostic marks are found in the abruptness of the angles formed by the projecting bones, the relation of these prominences to the styloid apophyses in the total absence of crepitus, and in the reduction, which is accomplished easily, suddenly with a characteristic sensation.

In this kind of practice the use of the X-rays is becoming almost universal and is of the greatest value, but is not always available.

*Treatment.*

Positive and complete reduction of the displacement is the "sine qua non," and the difficulty in its accomplishment varies greatly. Looking back at the cases of this kind which I have been unfortunate enough to have to treat, I must say without hesitation that although this lesion is called and is a fracture of the radius, I have had almost

invariably more trouble with the ulna than the radius, and I have no hesitation in saying that when I get that little bone safely back into the sigmoid cavity on the side of the radius where it belongs, I consider the rest easy.

Practically what have we here? A lower short fragment tilted upward and backward and generally impacted in the cancellated structure of the upper fragment.

An upper fragment displaced downward and forward, among the flexor tendons of the hand, and an ulna either dislocated or fractured, almost anywhere; also a mass of ruptured ligaments and muscles, as well as injured flexor and extensor tendons.

The indications for reduction are plainly: 1st. Anesthesia. 2nd. Straight extension and counter extension, if you have plenty of assistants—one at the elbow, the other taking the hand. 3rd. The operator himself manipulates the parts as follows: Both thumbs on dorsal aspect of lower fragment using steady and strong pressure downward and inwards toward the palmar surface, at the same time the fingers of both hands press the lower end of the upper fragment upwards toward the dorsal aspect of wrist.

The extension relieves the impaction—the pressure of the thumbs—on the dorsum, and the pressure of the finger ends on the palmar surface of upper fragment is usually all that is necessary. The operator is usually conscious of the crunching sound which indicates that the two surfaces are together again; he is quite assured of this if at the same time the deformity at the seat of injury disappears.

If, however, these procedures do not give a satisfactory result, the hand may be flexed to its fullest extent; extension being next up at the same time, we thus get the aid of the powerful extensor tendons which pass directly over the point of the lower fragment we are trying to depress, but this proceeding is seldom necessary. Just the reverse of this manœuvre hyperextension is advised in some textbooks, but I could never see why.

As to retentive apparatus, if the fracture is positively and perfectly reduced, splints are of very secondary importance; beyond doubt splints have done greatly more harm in this fracture than good, and are doubtless responsible for many an ankylosed joint and useless hand. But it is customary to use some form of retentive splint, usually one on the dorsum of the arm as far down as the phalanges, leaving the fingers free, and one on the palmar aspect down far enough to control the joint; these very light and retained with adhesive plaster, massage almost from the first, with passive motion, as soon as is safe—a straight wooden splint answering all indications. The pistol-shaped splint drawing the hand to ulnar side is not at all necessary. The supinator longus draws the hand somewhat to the radial side, but when the fracture is reduced is one of the means of keeping it so.

History tells us that from the days of Adam and Eve up to about a hundred years ago, this fracture was considered a dislocation and so treated (as I have before mentioned). It was no doubt reduced by manipulation and traction, but do we suppose there was any after treatment whatever? I think not, it would certainly be interesting if we had statistics to compare results then with those of the present day.

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## TYPHOID FEVER.*

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Typhoid fever is classed as one of the acute infectious diseases being caused by the specific bacillus of Eberth and characterized, pathologically, by hyperplasia and sloughing of Peyer's patches and the solitary follicles of the intestines, with parenchymatous changes in the principal viscera; clinically by its gradual onset, peculiar temperature curve, swelling of the spleen, rose-colored spots, diarrhœa, tympanites and sero-reaction.

*Read before the Volusia County Medical Society at Daytona, December, 1915.

It was only at a comparatively recent date that typhoid fever was clearly distinguished from typhus fever and this was appreciated at an earlier day in America than in either England or France, being due to the close clinical observations of our American authors.

Typhoid fever is the prevalent febrile infection of the present historical epoch, just as typhus was that of the three hundred years preceding the beginning of the nineteenth century, and the plague that of the middle ages. We might say it owes its present wide distribution and great prevalence to faulty disposal of sewage and neglect of the simplest sanitary laws. In all parts of the world typhoid fever prevails, but is especialy common in temperate climates. It is more common in late summer and early autumn, but occurs at all seasons of the year.

Typhoid fever is especially frequent among young, robust individuals and very rare in children under two years of age. Cases of influenza with associated catarrh of the gastro-intestinal tract may be followed by typhoid fever.

The bacillus typhosus is distributed in recent infections in the solitary follicles and Peyer's patches of the intestines, in the mesenteric glands, spleen, bone-marrow, liver and in the bile, they have been isolated from foci of suppuration in various parts of the body; their presence in the blood and rose spots has been demonstrated and in the course of the second week and afterwards they can be isolated by culture methods from the stools, also met with in the blood, urine, sputum and in a few instances have been found in perspiration.

Outside the body, typhoid bacilli retain their vitality in water, snow, ice, the superficial layers of the soil, dust and in the feces, for periods varying from several days to many months. Infected water is the ordinary means of transmission, by such water the infection of milk, uncooked vegetables, salads, fruits, oysters and clams, and it has been shown that lobsters also may become infected. Flies and atmospheric dust play an important part in the dissemination of the disease.

The open latrines and unscreened messtables were largely responsible for the terrible epidemics among our recruits in the practice camps at the time of the Spanish-American war.

Typhoid carriers are frequently the medium of transference, especially among cooks, and it has been found among sailors that have nothing to do with the handling of food, but by means of an open tank of drinking water, which becomes contaminated by the carrier's hands in dipping water from the tank.

The autogenous typhoid vaccines have been used on typhoid carriers, but without any curative effect.

When the bacilli find their way into the intestinal tract, the evolution of the disease is as follows: Being resistant to dilute acids, they are by no means wholly destroyed by the hydrochloric acid of the gastric secretion. If the acid be absent or the water or other fluid containing them be ingested, when hydrochloric acid is not secreted, they pass into the intestine and colonize and multiply in the lymph structures, finding their way into the mesenteric glands and thence by means of the blood to the spleen, liver, kidneys and bone-marrow. In these locations and elsewhere they form soluble toxins, which circulating in the blood, exert their influence especially upon the nervous system and the nutrition and thus give rise to fever and other constitutional symptoms. A general infection with the bacilli without localized lesions known as typhoid septicemia sometimes occurs.

The period of incubation varies upon the average between ten days and three weeks, this period runs its course without symptoms, provided prodromes are not included.

During the prodromal stage, the onset is very rarely abrupt, as a rule it is preceded by a period of impaired health, characterized

by malaise, feebleness, indisposition to bodily or mental effort, loss of appetite, headache, vertigo and disturbed sleep.

Abdominal uneasiness, even pain and diarrhœa are often present at this time. Slight but transient rises of temperature may occur, also bleeding at the nose is common.

An attack of typhoid fever begins with a distinct and sustained elevation of temperature, the rise is frequently attended with chilliness, which may be repeated, but rarely by a pronounced chill. During the first four or five days, the temperature rises in the evening from one to two degrees higher than upon the previous evening and each morning a degree or more above that of the preceding morning. By this time the temperature has reached its fastigium, 103°-105°, and with slight morning remissions remains, in the absence of complications, at this level until the end of the second week. During this period there are lassitude, headache, anorexia, thirst, a hot, dry skin, diminished urine and restless sleep.

The headache becomes more severe and is attended with tinnitus aurium and delirium. The tongue is coated and is seen to be of a bright red color at the edges and tip, "red tongue fever"; at this stage constipation is the rule, but laxatives act with unusual energy.

Toward the end of the first week spontaneous diarrhœa often occurs; there are cases, however, in which constipation continues throughout the attack. The spleen is found, upon palpation, to be enlarged toward the end of this period; there is slight tympanitic distention of the abdomen and tenderness in the ileocecal region. A few scattered medium sized dry rales may usually be heard upon auscultation of the lungs. The pulse is rapid, usually between 90 and 110, but less so in proportion to the rise of temperature than in many other acute diseases.

During the second week, the fever assumes the subcontinuous type, the range between the evening rises and morning remissions not greatly exceeding those of health.

The symptoms become more severe, about the tenth day the headache spontaneously ceases and is replaced by somnolence and stupor, which alternate with delirium, usually wandering but sometimes noisy and active. The facies is dull, faintly flushed, sometimes slightly cyanotic. The lips and tongue are dry and a tendency for sordes to collect upon the teeth and gums. Diarrhœa and tympanites are aggravated, there is decided enlargement of the spleen and between the sixth and tenth days the eruption makes its appearance, commonly upon the abdominal and lower thoracic regions anteriorly. Traces of albumen are found in many of the cases.

During the third week, the temperature assumes the remittent type, showing morning remissions of increased length, the pulse becomes more feeble and frequent (110-140), there is muscular tremor. Diarrhœa and tympanitic distention of the abdomen may increase; if previously absent, it may now appear. Weakness is most marked and wasting conspicuous, stupor and delirium continue. The rash now, as a rule, gradually diminishes and does not, in most cases, again appear.

This is especially the period of severe complications, hypostatic pneumonias, bed sores, parotitis, hemorrhage and perforation.

During the fourth week the fever is intermittent, the morning remissions gradually falling to normal or slightly subnormal ranges, and the evening rises progressively diminish until they no longer transcend the normal. The tongue becomes clear and moist, the diarrhœa ceases and there is a rapidly increasing and urgent desire for food. The spleen undergoes involution, the tympanitis subsides, the pulse becomes stronger and fuller. The foregoing sketch represents a severe attack of typhoid fever unmodified by treatment and terminating in recovery.

The problem in diagnosis is to determine,

not the nature of a well-defined typical case of typhoid fever, but to recognize the atypical cases and to differentiate them from the affections to which they present features of resemblance and to do this successfully at the earliest possible moment, since failure in this respect leads to indifference in regard to the search for the cause of the attack on the one hand and neglect in the proper treatment and disposal of evacuations on the other.

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## VACCINE THERAPY.*

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No other one branch of therapeutics has received the attention in the past few years as that which has been devoted to the use of vaccines and sera. These methods of treatment are entirely due to the magnificent work of Dr. Pasteur and after him Lister, Jenner and some others who have made valuable contributions. It is my purpose to present to you a few of the more important facts concerning this particular form of therapy.

Vaccine therapy is the treatment of disease by a preparation of killed bacteria, suspended in a normal saline solution and which is injected for the purpose of raising the opsonic index of the patient suffering from the infection by that particular form of micro-organism. The object of this therapy is to produce an immunity in the individual affected. Immunity may be either active or passive, depending on the nature by which it is obtained. Active immunity may be brought about in a number of various ways, one of which is by the person having a certain disease, say smallpox, and in the future he becomes immune to another attack. Acquired immunity may be brought about by inoculation with attenuated micro-organisms or by beginning with small doses of virulent organisms and gradually increasing the dose until the person becomes resistant to a quantity of the infection that would have, if injected in the beginning, produced death. The acquired tolerance for morphine by the habituate illustrates this method.

Passive immunity, however, is obtained by the injection of a serum made from the blood of an animal that has previously been made actively immune by some of the methods just given. This serum contains the resisting force or antibodies to that infection to which he has been made actively immune, and it is administered to an individual who has not the power of manufacturing enough of these antibodies to overcome the virulency of the infection from which he is likely to suffer. An example of this is the use of antitoxin in diphtheria.

In order that we may better understand the action of these immunizing agents, it is best to review some of the more acceptable theories of immunity. I will necessarily have to be brief, for they are in themselves exhaustive subjects. The first to be considered is the theory of phagocytosis advanced by Metchnikoff. He believes that the phagocytes or polynuclear leucocytes of the blood stream have the power of devouring the bacteria and of digesting them. And that the cure of the disease depends on whether or not there are a greater number of phagocytes or of bacteria. These phagocytes are amoeboid in character and have the power of going from place to place, depending on where the infection lies. They also have the power of passing through the vessel wall by means of their pseudoppia and combating the bacteria at their source of entrance. When these cells go to place of infection it is called positive chemotaxis and when there is a focus of infection and no effort is made by the phagocytes to go there it is termed negative chemotaxis on their part. Phagocytosis may be intensified in a number of ways, especially by the introduction of blood serum from animals that have been immunized from that particular disease. It has been demonstrated that this

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serum has certain substances which render the bacteria more easily digested by the phagocytes. To these substances have been given the term opsonins. They are present to a certain extent in normal individuals, but more so, by far, in animals that have active immunity. The process by which the opsonins render the bacteria inert is called sensitization. For therapeutic purposes killed bacteria are used and when injected at first there is followed a lowered phagocytic action which is called the negative phase and this, in a few days is followed by a rise in phagocytic power and is termed the positive phase. The injection of these killed bacteria is called vaccine therapy.

The other main theory of immunity is the side-chain theory demonstrated by Paul Ehrlich. This is now generally accepted the more reliable. Ehrlich believes that each cell possesses certain chemical affinities which enable it to attract and attack certain substances that are necessary for its nutrition. These chemical routes possessed by the cells are called receptors. Toxins are attracted to the cells by receptors in the same manner as in nutritional substances. Therefore, if poison is attracted to a cell and there are more molecules of that poison than there are of receptors, then that cell is destroyed, but if, on the other hand, there are more receptors then the poison is neutralized and the cell is saved. If the cells are attacked very much, then there is a tendency for them to manufacture more receptors and as they continue to do this, unless they are overwhelmed by the poison before they can accomplish this purpose, the poison is neutralized and there is an excess of receptors turned loose in the blood stream. These free receptors are termed antitoxins and are capable of making that individual actively immune, and able at once to throw off any subsequent attack, by having an excess of antitoxins for the toxin liberated by the bacteria causing that particular disease. The scope of this paper does not permit a discussion of cytoclysis or bacteriolysis, which are such integral parts of Ehrlich's theory of immunity.

The agents used in the production of these forms of immunity are sera and vaccines. There is marked difference between a serum and a vaccine. For instance, there are certain bacteria that are exoteric, that is, they liberate a poison in the culture media in which they grow and it is extracellular in character. The diphtheria bacillus is an example of this form of bacteria. In this case we have to use an antitoxin to neutralize the toxin liberated by that bacillus before it can do sufficient damage to the body and also to give the body time to manufacture substances to kill the bacteria. Here the action of the bacteria is purely a chemical one. As has been said before, we obtain this serum from an animal that has been made actively immune by drawing its blood and obtaining the serum from the clot.

By far the greater number of bacteria have what are known as endotoxins and they are only liberated when the bacterium dies. In this case we have to use a vaccine or by injecting a number of killed bacteria which will allow the body to produce antibodies to neutralize these and have an excess left to combat further attacks on the part of the bacteria. Thereby gradually increasing the injection of these killed bacteria there is left in the body a large number of these antibodies to protect it against subsequent attacks of that particular disease. The administration of typhoid vaccine illustrates this form of therapy.

The methods of preparation of sera and vaccines are essentially different. For example, in the preparation of diphtheria antitoxin, a pure culture of the diphtheria bacillus is obtained and from this its exoteric toxin is injected into a healthy horse in gradually increasing doses. And it will be noticed that after each dose there is followed a rise in temperature showing the reaction of the horse in manufacturing antitoxin. After several doses there is no rise in temperature, which shows that the horse

has manufactured an excess of antitoxin and can immediately neutralize all the toxin injected. The horse is then bled under sterile precautions and the antitoxin obtained from the blood serum and standardized. A unit of antitoxin is that amount required to neutralize an amount of toxin that would kill a guinea pig of a certain weight. Now, in the preparation of vaccine the bacteria causing the disease are isolated and grown on suitable culture media for about eighteen to twenty-four hours and then the culture is scraped off and emulsified with a normal salt solution. It is then sterilized by the addition of a five per cent carbolic acid solution or by heating at about 50° Centigrade, for a certain length of time. The best form of vaccine is the autogenous, which consists in the isolation of the bacteria causing the disease in the individual affected and growing this particular organism on suitable culture media from eighteen to twenty-four hours. It is then prepared the same as other vaccines. The ordinary stock vaccine, that is generally used by the practicing physician, is prepared from organisms grown on culture media in the various biological laboratories in this country.

The most valuable guide to the dosage of sera and vaccines is the opsonic index. The size of the dose depends upon whether or not the positive phase does not occur or the negative phase lasts too long. A high temperature contraindicates the use of vaccine. Vaccine should be given in stated doses while the dosage of sera, such as the diphtheria antitoxin, should be given according to the gravity of the disease. In general terms the doses of the several vaccines are given below:

Staphylococcus, 100,000,000 to one billion.

Streptococcus, 5,000,000 to two hundred million.

Gonococus, 50,000,000 to eight hundred million.

In giving typhoid vaccine it is the custom to begin with five hundred million at the first dose, and at the end of ten days inject one billion, and in another ten days one billion more are given. The dosage of diphtheria antitoxin has greatly increased in the past few years. It is now customary to start with ten thousand units and in six hours twenty thousand and in another six, if there is not a decided improvement in the condition of the membrane, then another twenty thousand units are given. As high as fifty to one hundred thousand units have been given with excellent results. The technic used in the administration of these vaccines is very simple. An area, say on the insertion of the deltoid muscle, is sterilized with iodine and alcohol and the vaccine is injected just under the skin with a sterile syringe just as an ordinary hypodermic is given.

The value of the use of sera and vaccines is clearly shown by the use of the typhoid vaccine in the United States army. The results obtained there show that the use of this vaccine is even more efficacious than the use of smallpox vaccine in that disease. Statistics, as compiled by Major Russell of the U. S. army, show that the typhoid rate has been reduced in the past twelve years from 9.43 per thousand to .26 per thousand, or a reduction of over 97 per cent, while the death rate fell from .64 to .03 per thousand, or a reduction of over 93 per cent. These conditions were entirely brought about by the use of typhoid vaccine. As to the danger of its administration, over two hundred thousand men in the army have been immunized with typhoid vaccine without a single fatality. This immunity is supposed to last from two to five years, but it is best to be vaccinated every two or three years. The great reduction in the mortality of diphtheria, since the discovery of its antitoxin, unquestionably shows the value of the use of antitoxin in that disease.

In this paper, gentlemen, I have endeavored to present the facts of this subject as clearly and as understandingly as I

could, leaving out as much technicality as possible. This being such an exhaustive subject, I am afraid that I have not gone into detail as much as I should have. Of course, I do not claim any originality for the contents of this paper, for everything I have here has been taken from collateral readings.

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## PROPAGANDA FOR REFORM.

FRECKLE AND BEAUTY LOTIONS. — The worthlessness and, in many instances, the dangerous character of nostrums sold as freckle removers and beautifying preparations are indicated by the following analyses, taken from the reports of various state chemists: Hill's Freckle Lotion was found to be a 1.84 per cent solution of corrosive mercuric chloride. Kingsbery's Freckle Lotion was found to be a solution of corrosive mercuric chloride containing 5.3 parts in 1000. Kulux Compound, a "prescription fake" freckle and tan remover, was found to contain zinc oxide, bismuth subcarbonate, glycerine and water. Mrs. McCorrison's Famous Diamond Lotion No. 1, said to remove moths, freckles, pimples, etc., was found to be essentially a solution of 28.2 parts of corrosive mercuric chloride in 1000 of water. Neroxin, a "prescription fake," said to remove blackheads, was found to contain borax 55 per cent and "soda" 25 per cent. Othine, sold as a freckle remover, is reported to contain bismuth subnitrate and ammoniated mercury with a fatty base. Perry's Moth and Freckle Lotion Compound was found to be a 16-in-1000 solution of corrosive mercuric chloride containing in addition a small amount of a lead salt. Pyroxin, sold on the "prescription fake" plan as an eyebrow and eyelash grower, was found to be perfumed vaseline. Rose-Kayloin, advertised in fake health departments of some newspapers, was found to contain 80 per cent sulphate and 15 per cent potassium carbonate. Mme. Rupert's Face Bleach is reported to be a 4-in-1000 alcholic solution of corrosive mercuric chloride, containing a small amount of benzoin. Stillman's Freckle Cream was found to be an ammoniated mercury paste. Tan-A-Zin, a complexion beautifier, was found to have for its essential ingredient ammoniated mercury. Sarah Thompson's "Wrinkle Lotion" was found to contain alum 7 per cent, glycerine 29 per cent and water 64 per cent. Zintone, said to produce a faultless complexion quickly, is reported to contain borax 23 per cent, stearic acid and soap 77 per cent. Though the external use of mercury salts is fraught with danger, the nostrums above shown to contain such poisonous ingredients are sold with the claim that they are practically harmless. (*Jour. A. M. A.*, Nov. 20, 1915, p. 1835, and Nov. 27, 1915, p. 1933.)

VERACOLATE.— The Council on Pharmacy and Chemistry reports that "Veracolate (plain)" (The Marcy Co., Boston, Mass.) is semisecret in composition, unscientific in combination and exploited under unwarranted claims. It reports that the same criticisms apply to "Veracolate with Pepsin and Pancreatin" and "Veracolate with Iron, Quinine and Strychnine." For "Veracolate with Pepsin and Pancreatin" is quantitative formula is given: "A compound containing the bile acids, sodium glycocholate, sodium taurocholate with cascara sagrada and phenolphthalein." "Vercolate with Pepsin and Pancreatin" is said to contain, in addition to the indefinite "Veracolate," the two mutually incompatible ferments, pepsin and pancreatin, and oil of peppermint. The complexity of "Veracolate with Iron, Quinine and Strychnine" has increased so that this unscientific mixture is claimed to contain seven constituents. These products are discreditable to the medical and pharmaceutical profession alike and their use is against the public good. (*Jour. A. M. A.*, April 24, 1915, p. 1440.)

TAUROCOL.—The Paul Plessner Co., of Detroit, Mich., markets Taurocol and Taurocol Compound Tablets. The company makes a pretense of giving the formula—minus any quantities—thus: "Taurocol is a combination of bile salts, extract of cascara sagrada, phenolphthalein and aromatics." Taurocol Compound Tablets are said to contain, in each, "Taurocol (Bile Salts)" gm. .1296, "Pepsin 1-3000" gm. .0324, "Pancreatic Ext." gm. .0324, "Extract Nux Vomica" gm .0081 and "Aromatics" q. s. The Council on Pharmacy and Chemistry points out that the composition and the therapeutic properties claimed for these preparations are essentially the same as those claimed for Veracolate and Veracolate with Pepsin and Pancreatin. It reports that the objections made to these also apply to Taurocol and Taurocol Compound Tablets. (*Jour. A. M. A.*, April 24, 1915, p. 1441.)

THE OXYPATHOR.—An order forbidding the use of the United States mails has been issued against the Oxypathor Company, Buffalo, N. Y., and its branches at Columbus, Ohio, and Wilmington, Del. The Oxypathor consists essentially of a piece of nickel-plated tubing filled with inert material, sealed and having attached to each end a flexible cord with a garter-like attachment at the free ends. This outfit was sold with the absurd claim that it caused the absorption of large quantities of oxygen through the skin of the user. (*Jour A. M. A.*, May 8, 1915, p. 1600.)

VENARSEN.—The Council on Pharmacy and Chemistry reports that while formerly Venarsen was marketed with indefinite statements as to its identity and in a way to suggest analogy with salvarsan, it is now admitted to be essentially a sodium cacodylate solution, each ampule containing about 9 grains sodium cacodylate, 1-40 grain mercuric iodid and 3-4 grain sodium iodid. The Council finds the therapeutic claims made for Venarsen to be exaggerated and unwarranted and holds the administration of sodium cacodylate and mercuric iodid in fixed proportions intravenously to be an irrational procedure. (*Jour. A. M. A.*, May 22, 1915, p. 1780.)

NOMENCLATURE OF DRUGS.—The first requisite of successful prescribing is to know what one is giving. Non-descriptive or therapeutically suggestive names for drugs lead to uncritical prescribing, as has been shown by the random use of heroin and the untoward results from Atoxyl. Often proprietary names make it possible to charge an exorbitant price for a well-known drug, as when hexamethylenamin is sold as Uritone, Urotropine or Cystogen and theobromin sodium salicylate as Diuretin. Since the action of drugs depends on their chemical nature, the name should at least suggest the chemical composition of the drug or its source and relationship. The lack of scientific nomenclature of drugs is discreditable and hampering to modern medicine. Physicians should eschew the fanciful or therapeutically suggestive names provided by manufacturers and give preference whenever possible to non-proprietary descriptive names for drugs. (*Jour. A. M. A.*, May 29, 1915, p. 1853.)

THE N. F. IMITATION OF ELIXIR LACTOPEPTINE.—Nearly forty years ago the essential worthlessness of Lactopeptine was brought to the attention of the pharmaceutical profession. In spite of this knowledge the pharmacists have included imitations of Lactopeptine and Elixir Lactopeptine in the National Formulary under the titles Compound Powder of Pepsin and Compound Digestive Elixir. The *N. A. R. D. Journal*, devoted to the business rather than the professional side of pharmacy, defends the Compound Digestive Elixir on the ground that "physicians keep right on prescribing it." The pharmaceutical profession should consider that pharmacists will in the end lose the confidence of the medical profession and the public by the tolerance of worthless pharmaceuticals. (*Jour. A. M. A.*, Oct. 23, 1915, p. 1467.)

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**Next Meeting — Arcadia — May 10-12, 1916**

## VOLUSIA COUNTY NUMBER.

We have frequently stated in these columns that THE JOURNAL OF THE FLORIDA MEDICAL ASSOCIATION can be made just as good a journal as the members of the Association desire to make it. The medical profession in Florida is as representative a body of medical men as exists in the country and if each member will do his share which, with six hundred members in the state organization, only means an occasional contribution, there is absolutely no doubt that we can maintain a state journal second to none.

This number of THE JOURNAL is dedicated to the Volusia County Medical Society, and we hope from time to time that we may have special numbers representing other county organizations.

The Volusia County Medical Society is a live organization, in fact one of the best in the state. We congratulate the officers and members on its being one of seven county organizations in the state whose total membership was paid up for the last fiscal year.

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## THE NATIONAL BOARD OF MEDICAL EXAMINERS.

"Until about forty-five years ago, only one or two states had any laws regulating the practice of medicine, and until 1882, no state required an examination. At that time in the majority of states a diploma from a medical college was all that was necessary to obtain for its holder the right to practice. The physician who desired to move to another state was put to no particular hardship, since all he had to do was to present his diploma. By 1902, however, the number of states in which the examination of all applicants was required had been increased to thirty-eight. The 'scrap of paper' called a diploma ceased to have value except to the extent of admitting its holder to the licensing examination—an ordeal which few men who had been in practice for several years could pass, at least without the sacrifice of

much time and labor for a review of the fundamentals of medicine. Important as was such an examination for the recent graduate in order to prove his training in those fundamentals, it consisted largely of nonessentials for those who had long been in active practice.

"In order to correct this apparent injustice to practitioners of medicine, a system of reciprocity was devised; the state board waived its right to test the qualifications of the applicant, and accepted the certificate of another board in lieu of its own examination. Even at present the provision made for reciprocity provides for only a small proportion of the instances in which physicians, for good reasons, desire to move from one state to another.

"Fourteen years ago *The Journal of the American Medical Association*," from which this comment is taken, "called attention to these conditions, pointed out that only nine states remained in which a physician's diploma would entitle him to secure a license without the examination, and recommended a voluntary national board of medical examiners as the most practical solution of the problem. At that time the three government services in Washington were suggested as the basis for the creation of this national board. It was also shown that the educational standards should be sufficiently high and the character of the examination so practical and thorough that the qualification thus secured could be recognized by the licensing boards of the various states. As announced about three months ago, a definite movement was under way and, as shown on page 762 this week, the creation of such a board is now an accomplished fact.

"No scheme could be adopted which would not be subject to criticism for some reason or other, but the plan on which this board is created appears to leave little ground for criticism. Since it is a voluntary board, its certificate need not be accepted by any state licensing board unless it sees fit to do so. On the contrary, this board will be in position to conduct an examination more thorough and more practical than could be possible by individual licensing boards. The recognition of this board's certificate, after its value has once been established, will be under the exercise of the same discretionary powers of the state board as is employed at the present time in the recognition of the certificate of another licensing board. In both instances the licensing board accepts a recognized certificate of qualification in lieu of its own examination.

"Heretofore the great obstacle to the establishment of a national board has been the lack of sufficient money to meet expenses until the board could me placed on a self-supporting basis. This need has been met by the Carnegie Foundation for the Advancement of Teaching, which is providing the necessary funds.

"The first examinations are to be held in the city of Washington, where adequate laboratories, equipment and clinical material have been placed at the disposal of the board. The ultimate success of this board, however, requires that the examinations be held in different sections of the country, since few medical graduates will go to the expense of a trip across the continent to take such examinations. Any high grade university medical school will doubtless be glad to place its laboratories and ample laboratory apparatus at the service of this board, and also to guarantee an adequate amount and variety of clinical cases to meet the needs of the examination.

"The board has important problems to solve," says *The Journal*, "the possibilities for good that rest in the board, both as regards the public and the medical profession, are so great that careful deliberation should precede every step taken toward the solution of these problems. One mistake may put back for a decade this movement, which is now so promisingly started. By the success of this undertaking, not only will the standard of the medical profession be

improved, but the public also will be benefited."

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## DID YOU BITE?

"Do you want five dollars? If so, and if you are a sufficiently prominent physician, the 'patent medicine' interests will gladly send it to you. Possibly it will be for a mail-order diagnosis and treatment. For example: You may receive a letter from a lady in some outlying country town who says that she has heard of your skill in treating diseases peculiar to women. She has a daughter who is suffering from dysmenorrhea, menorrhagia or what not and she is afraid that the girl will 'go into consumption.' Enclosed please find a money order for five dollars. Will you not kindly send her a prescription (preferably in liquid form) for the purpose of helping her daughter's condition? Of course, diagnosing disease in and prescribing for patients one has never seen will hardly qualify as the scientific practice of medicine. But the 'patent medicine' interests are apparently willing to part with all the five-dollar bills that are necessary in order to obtain these long-distance prescriptions and diagnoses. Possibly, however, a variant is tried. You may be called up by phone and a man will tell you that his wife is suffering from some ailment peculiar to her sex and desires to be operated on. What will you charge for the operation? You may mildly suggest that this question cannot intelligently be answered until you have seen the lady and gone into the case thoroughly. Then the gentleman at the other end of the wire will ask you whether it is not a fact that you charge according to the ability of the patient to pay rather than according to the seriousness of the operation. Or possibly the scheme may have yet another angle. If you are a rather well-known internist or a gynecologist of note an attempt may be made to get you to write a prescription containing, as at least one of the ingredients, viburnum prunifolium—a preparation not unknown to the 'patent medicine' world. Many other changes are being rung, for this is a time of stress with 'patent medicine' fakirs, and in order to defend their nefarious trade they are seeking to manufacture evidence of the *argumentum ad hominem* type. Such evidence may be considered valuable in prosecuting libel suits against the medical profession."—*Jour. A. M. A.*, Feb. 19, 1916.

# Cancer Department

*"In the early treatment of cancer lies the hope of cure."*

**AMERICAN SOCIETY FOR THE CONTROL OF CANCER**

## A FORTUNATE DECISION.

Mr. W., a man of robust health, a farmer, fifty years of age, went into a doctor's office to consult him, giving the following history:

Last August he had a crop of fever blisters on his lower lip, which lasted about three weeks, all of them disappearing except one. This one had several scabs form on it but each time the scab came off it left a small ulcerated area. Finally about October it healed up smoothly, but left a small white thickened area in its place which had been there ever since, increasing somewhat in size. It was not at all painful, but worried him some by its presence. He said that he had consulted one doctor who told him he could take it off with a paste. This treatment he refused because he said he knew of one of his friends who had had a similar thing treated with paste, and that the paste had "eaten his whole lower lip off." The doctor whom he consulted recognized the potential danger of the growth, and advised its immediate removal. To this the patient readily consented, after having the condition explained to him. Within a half hour afterward the suspicious area, with a wedge

shaped piece of the lip was removed under novocain anæsthesia, with absolutely no pain, the promise of a hardly noticeable scar, and the relief of knowing that it was completely eradicated. The section was sent to the State Board of Health Laboratory the same afternoon, and three days later the following letter was received:

Dr. ———— ————,

————, Fla.

Dear Doctor:

The section of lip of Mr. W., which you submitted to us for examination shows the following changes: The germinal layer shows some thickening and an alteration in morphology and staining reaction. While there is no distinct tumor mass, the underlying connective tissue is fibrous and shows enlargement of nuclei such as is characteristic of a precancerous condition. We consider it very fortunate that he has had the area removed at this time as in all likelihood there would have been developed a definite cancerous growth there in a short time.

Yours very truly,

Dr. ————,

Florida State Board of Health.

If this man had waited six months longer he would most surely have had to have an extensive operation, with not nearly so good a chance of permanent cure.

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## NATIONAL CONFERENCE OF CHARITIES AND CORRECTION.

Health conditions will be linked with nearly every phase of the problems of charity and correction to be considered at the forty-third annual meeting of the National Conference of Charities and Correction at Indianapolis, Ind., May 10th to 17th. One section, that on health, will be devoted entirely to a discussion, by physicians, of the part the medical practitioner and surgeon may play in social work.

Dr. J. N. Hurty, secretary of the Indiana State Board of Health, is chairman of the section on health, and Dr. Theodore B. Sachs, of the Municipal Tuberculosis Sanitarium of Chicago, is vice chairman. In the general session devoted to subjects of wider popular interest Dr. Eugene L. Fisk, director of hygiene of the Life Extension Institute, New York, and Professor L. J. Rettger, of the Indiana State Normal School, will discuss longer and more effective living.

In the section meetings there will be a symposium on disease, ill health and sickness, and their bearing upon crime, insanity and poverty. The speakers will be Dr. David C. Peyton, superintendent of the Indiana Reformatory, and Dr. S. E. Smith, superintendent of the Eastern Hospital for the Insane, at Richmond, Indiana. Dr. E. R. Hayhurst, of the Ohio State Board of Health, will lead a discussion of industrial hygiene. The relation of venereal diseases to public and individual health will be considered by Dr. C. S. Woods, superintendent of the Methodist Hospital, Indianapolis, and Dr. William F. Snow, secretary of the American Social Hygiene Association. A number of dental surgeons will also participate by giving their views on the relation of oral hygiene to public and individual health.

Other sections allied in subject matter to that on health will take up the problem of inebriety and the relation of feeble-mindedness and insanity to social questions. The former division of the conference will make a distinct contribution by presenting the results of an inquiry among large employers as to the results attained from their prohibition of drinking among employes.

A broad field of community problems will be covered by six other sections of the conference. That on the family and the community will take up the co-ordination of civic effort in small communities. In its general session it will consider conditions adverse to efficient public work under democratic government.

A section on unemployment will examine into the degree to which social workers are prepared for the next period of stress. Graham Romeyn Taylor, of *The Survey*, is in charge of a section on the promotion of so-

cial programs, in which representatives of labor, business men, editors and public officials will give their ideas on the relation of social workers' programs to the community in general.

The growing tendency to put relief work in the hands of public agencies will occupy much of the attention of a section on public and private charities. Problems connected with the organization and administration of charity work and the keeping of proper records will also be discussed.

The conference will be opened on the evening of May 10th with an address by the president, Father Francis H. Gavisk, in which the keynote of the entire gathering will be struck. A talk of exceptional public interest will also be given at this inaugural session by Ernest P. Bicknell, director of civilian relief of the American Red Cross. Mr. Bicknell will discuss war relief and his own experiences close to the firing lines in the various European war zones.

## POISONOUS FLY PAPERS.

A year ago, in discussing this subject editorially, we gave a partial report of the cases of arsenic poisoning of children from accidentally consuming the contents of fly-destroying contrivances during the summer of 1914. It was gratifying to note the number of medical journals that reprinted our editorial or commented upon the subject. The discussion was evidently a timely one.

For the summer of 1915 we have been able to secure the reports of the following cases:

| Month | No. | Fatal | Recovery Indicated | Recovery Doubtful |
|---|---|---|---|---|
| May | 1 | 1 | | |
| June | 2 | | | 2 |
| July | 5 | 2 | 2 | 1 |
| August | 14 | 5 | 8 | 1 |
| Totals | 22 | 8 | 10 | 4 |

These cases were reported by the daily press as occurring in the following states: Georgia, 1; Illinois, 6; Indiana, 2; Iowa, 2; Massachusetts, 2; Michigan, 2; Missouri, 1; Nebraska, 1; New York, 1; Oklahoma, 1; Ohio, 1; Pennsylvania, 2; a total of twenty-two cases. This report must necessarily be considered as very incomplete and but an indication of the possible extent of a wholly preventable danger.

We again point out the fact that the symptoms of arsenical poisoning are very similar to those of cholera infantum and that undoubtedly a number of the cases of cholera infantum that occurred were really cases of arsenical poisoning, and death if occurring was attributed to the fact. The cases reported were of children ranging in age from 1 to 6 years. These little patients are not old enough to tell what they have taken when questioned as to their illness and unless they are seen consuming the fly poison the actual cause of their sickness or death is overlooked and the fatality ascribed to cholera infantum or to some other similar causes and the error in diagnosis goes undetected.

We repeat, arsenical fly destroying devices are dangerous and should be abolished. Health officials should become aroused to prevent further loss of life from their source.

Our Michigan Legislature, this last session, passed a law regulating the sale of poisonous fly papers. Similar enactments should be secured and enforced in every state in the Union.—*The Journal of the Michigan State Medical Society.*

## THE CONTROL OF DIPHTHERIA EPIDEMICS.

The whole subject of the control of epidemics of diphtheria may be briefly summarized as follows: Methods commonly employed in the fight against diphtheria are not adequate; Schick's test requires no special technic that can not be easily developed by any physician and, therefore, is available to all. Schick's test is a prompt, economic and satisfactory method of quelling epidemics of diphtheria when used together with swabs.—Miles F. Porter, M. D., *Journal of the American Medical Association*, March 11, 1916.

# Reviews from Current Literature

## EARLY DIAGNOSIS OF CANCER

Manges, Morris: The General Practitioner's Responsibility in the Early Diagnosis of Cancer. Am. Jour. of Surgery, Vol. XXIX, 1915, p. 377.

Manges, after remarking the difficulties often attending the early diagnosis of cancer, and the too frequent unobserved conversion of benign growths into malignant tissue, states that, "After all is said and done, the exploratory operation remains as the only crucial diagnostic and the only therapeutic measure. If the diagnosis has been made, it is the only means of cure; if the diagnosis has not been established, it is the only means to settle the doubt, and at the same time, it may render a radical cure possible, if cancer is the cause of the symptoms. The risks of exploratory operations today are less than two per cent; they are infinitely less than those of the disease itself.

"It may be accepted as a safe rule that when in doubt about symptoms in patients at the cancer age: *Don't wait—explore!* When we are sure of the diagnosis, we are also sure of the inevitable result if nothing is done. The general practitioner will have done his duty when he has *strongly suspected* the existence of a cancer in a given case; the exact diagnosis should be relegated to the surgeon and the pathologist."

The following paragraph seems particularly pertinent: "I will admit that the conditions under which many general practitioners work are far from ideal, and if we were placed as they are, we might possibly follow in their footsteps. The fault is not altogether that of the physician, for a large share must be placed at the door of the patients, who can not or will not understand the careful physician in his endeavors to establish a diagnosis. They are not sufficiently loyal to stick to one physician, or to follow his advice, or to give him sufficient time to study their symptoms. They care not for the diagnosis; they only want relief from their symptoms. It is to be sincerely hoped that the campaign of education which is being vigorously waged will in time enlighten the people as to the need of intelligent co-operation. But this is only an explanation, not an excuse. There are still too many physicians whose only aim is to palliate symptoms and not to make diagnoses. They fail to obtain proper histories; they do not examine their patients sufficiently; they allow palpable diagnoses to escape them. They permit the golden time for radical operations to slip by, since by their procrastination they convert operable cases into inoperable ones, so that when operations are finally performed they are palliative and not radical. It is here where the great reduction in cancer mortality is to be immediately obtained."

The author believes that, except in a few types of occupational cancer, we cannot lessen the number of malignant diseases by improved hygiene as we have reduced typhoid, tuberculosis, etc., and that the only method of reducing cancer mortality is by a campaign of education of both patients and physicians.

R. C. T.

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## VICARIOUS MENSTRUATION

Condit, Wm. H.: Compensatory (Vicarious, Ectopic), Menstruation: Xenomenia; Memmes Devii. Am. Jour. Obst., Vol. LXXIII, 1916, p. 238.

The author prefaces his paper by giving a detailed clinical history of a case of vicarious menstruation. He operated upon the patient in 1907 removing both ovaries and all the other pelvic organs. Fifteen days after operation she had all the subjective symptoms of the menstrual period. At the same time a nævus, the size of a split pea, situated in the left intercostal space became swollen and ecchymotic from a hemorrhage into it. The symptoms disappeared in four days. For the next 21 months the same phenomena appeared every 28 days, the nævus gradually enlarging to the size of a child's head. Finally, during one of these attacks, the tumor ruptured and then was removed surgically. For the next year the

left mammary gland took the place of the nævus, becoming very much swollen and ecchymotic at the periods. The attacks finally subsided and the gland finally became normal.

Condit discusses the various theories of so-called "vicarious menstruation" and draws the following conclusions:

By many menstruation is regarded as a flow from the uterus only and as incapable of substitution by hemorrhage from any other part of the body.

Menstruation after hysterectomy and bilateral oöphorectomy has been attributed to incomplete removal of the organs in question, yet upon postmortem examination in some such cases, no such vestiges of the functional organs have been found.

Williams reports that he has noted animal menstruation recurring in cows where he was sure that both ovaries were removed completely. Operating a second time cystic Graafian follicles were found at the point of removal of the ovary.

It would consequently seem that not only may these ova exist in the tissues somewhat outside the ovary, but also that when the gland itself has been surgically removed, they are capable of developing ova sacs.

The conclusion arrived at in this study is, that menstrual abnormalities or irregularities are due to blood pressure changes in the individual, together with some atrophic or pathological changes in part or parts where the hemorrhage manifests itself. In the particular case reported, the peculiar demonstrations were brought about by the failure of the individual physical economy to adapt or adjust itself to the change brought about in the blood pressure, by removal of the part or parts previously acting as the safety valve of this particular economy.

G. R. H.

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## JOINT SYPHILIS

O'Reilly, Archer: Joint Syphilis in Children. Am. Jour. of Ortho., Surg., Vol. XII, 1915, p. 683.

The writer states that syphilis of the joints in children as well as in adults is much more frequent than we suppose, and that it is often diagnosed and treated as tuberculosis, infectious arthritis, etc. The congenital type of the disease usually manifests itself in children between the ages of eight and fifteen, as a symmetrical swelling, with a variable amount of effusion, and with but little pain or interference with function. While the comparative freedom from pain is not distinctive, it should always excite suspicion and a Wasserman should be done. Muscular spasm, as in tuberculosis, is infrequent; disturbances of function are largely mechanical. Syphilitic arthritis may show itself in many ways and is most often mistaken for tuberculosis.

R. C. T.

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## THE DIGESTIBILITY OF MILK PROTEIN

Holt, L. Emmett: The Digestibility of the Proteins of Milk and Their Rôle in Infant Nutrition. Archives of Pediatrics, Vol. XXXIII, 1916, p. 13.

The protein of cow's milk is more readily digested than was formerly believed, and symptoms formerly ascribed to it are due to other conditions. In practically all conditions pepsin is abundantly secreted in the stomachs of infants and the use of such ferments rests on no rational basis.

The infant needs no more actual protein than is contained in average human milk, but the protein of human milk contains in large quantity certain amino-acids which are essential to growth and development. These amino-acids exist to a smaller extent in cow's milk. Therefore, in order for an artificially fed infant to maintain a healthy growth it is essential that relatively large quantities of cow's milk protein be given. Not that the protein itself is so much needed but that large quantities of protein must be administered in order to supply the infant with the necessary amino-acids. Any excessive amount of protein within reason is utilized by the organism and is followed by increased excretion, which is nearly proportional. Hence the amount of protein contained in breast milk can not be accepted as a criterion of how much protein

is required when cow's milk is employed. No clinical or laboratory evidence has been adduced to show that protein, in reasonable quantities, is harmful. J. D. L.

### FAT IN INFANT FEEDING

Morse, John Lovett: Present Opinion as to the Rôle of Fat in Infant Feeding. Archives of Pediatrics, Vol. XXXIII, 1916, p. 20.

More than 90 per cent of the fat ingested is usually absorbed, though the absorption of fat in babies who are passing "soap stools" is less than when the stools are normal.

A healthy infant can digest and utilize the fat of cow's milk as well as that of mother's milk. Therefore, normal infants may be fed cow's milk which contains the same per cent of fat, 3 to 4 per cent, as breast milk. This statement refers to healthy infants and not to those who have acquired a fat intolerance due to bad feeding. Fats and carbohydrates can not be used interchangeably beyond a certain point and an effort to supply the fat needed of an infant by feeding it excessive carbohydrates is certain to develop a carbohydrate indigestion. Many ills that have been attributed to fat in the food are due to an excess of one of the other food elements or to improper relation of the food elements to each other. When there exists an excessively acid condition of the intestinal contents the administration of much fat will render the condition worse. J. D. L.

### HYDROCEPHALUS

Frazier, Charles H.: Types of Hydrocephalus, Their Differentiation and Treatment. American Journal Diseases of Children, Vol. II, 1916, p. 95.

The author discards the old nomenclature of "external" and "internal" hydrocephalus and suggests in its stead a new classification having a physiologic background, with clinical application.

He divides hydrocephalus into four types: (1) hydrocephalus obstructions; (2) nonabsorptus; (3) hypersecretious; (4) occultus.

In the first variety there is mechanical obstruction to the drainage of cerebrospinal fluid from one or more ventricles into the subarachnoid space. For this type he advises puncture of the corpus callosum as being the simplest and most effective means of securing drainage into the subarachnoid space.

For the nonabsorptive type he recommends the establishment of a drainage tract into the pleural cavity.

For those cases due to hypersecretion, rendered so by increased activity of the charoid plexus, most conspicuous aid is secured by the feeding of thyroid extract.

The occult type is characterized by an excess of fluid somewhere within the cranium without any necessary increase of cranial dimensions. This type may demand a decompression operation in order to relieve pressure.

The paper supplies clinical tests for the purpose of differentiating the four varieties of hydrocephalus. J. D. L.

### THE CAPSULE OF THE FAUCIAL TONSIL

Mahuen, G. Hudson: The Surgical Anatomy of the So-called Capsule of the Faucial Tonsil. The Laryngoscope, Vol. XXV, 1915, p. 685.

The author emphasizes the fact that while we hear much concerning the capsule of the faucial tonsil, few, if any, of us have any knowledge as to what the capsule is, where it originates and of its function, if it has any. Some question now its existence.

In discussing an intracapsular tonsillectomy he states that the expression "means a tonsillectomy in which the tonsil is entirely removed while the major portion of the capsule is left in the fauces where it naturally belongs and where it completely lines the tonsillar fossa. On the other hand, an extracapsillar tonsillectomy is one in which the entire capsule is removed, leaving an opening through the intrapharyngeal aponeurosis into the deeper regions of the neck and exposing the superior constrictor, the palatoglossus and palatopharyngeus muscles."

For a long time he has tried to determine

why it is that in some tonsillectomies there is so much cicatricial contraction with pharyngeal and palatal deformities while in others we see an entire absence of these postoperative conditions.

He believes the problem would be solved by enucleating the tonsil "not only with the least possible traumatism, but with the least possible capsule, and I think I have discovered that an intracapsullar tonsillectomy in which the major portion, at least, of the so-called capsule may be left in the tonsillar fossa, is altogether within the realm of possibility."

After discussing the anatomy of the tonsil with special reference to its capsule, he reaches the following conclusions:

The so-called capsule of the faucial tonsil is not a capsule at all in a strict sense of the term, and it consists in part, at least, of that portion of the intrapharyngeal aponeurosis in a recess of which the tonsil attaches itself in the course of its development.

The intrapharyngeal aponeurosis is a broad membrane having its attachment above to the base of the skull, and extending downward it not only separates the tonsil and the palatal pillars from the superior constrictor muscle and other important tissues in the cervical region, but folds of this membrane protrude themselves between the tonsil and the pillars of the palate; the anterior fold when it protrudes itself well in front of and below the tonsil constitutes what is known as the plica triangularis or plica tonsillaris.

In the course of its development in embryo and during infancy, the tonsil appears to appropriate a portion of the connective and musculo-fibrous tissue with which it is in juxtaposition and finally in adult life it becomes firmly attached to this membrane to which has been given the name intrapharyngeal aponeurosis, and a section of which seems to constitute the so-called capsule of the tonsil.

A complete extracapsullar tonsillectomy, therefore, must leave a window resection of the intrapharyngeal aponeurosis, not only exposing the palatal pillars and the superior constrictor muscle but opening up avenues of infection in the deeper regions of the neck.

A more desirable operation which may be called an intracapsullar tonsillectomy, or perhaps better still an intercapsullar tonsillectomy, is one in which the tonsil is removed with only the thin innermost layer of the capsule, the major portion of it being left in the pharynx as a complete lining for the fossa, where it serves as a strong wall of defense against infection in this region. This intra- or intercapsullar tonsillectomy may be done easily and accurately with an ordinary snare in connection with the original Sluder instrument. W. S. M.

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## NEW AND NONOFFICIAL REMEDIES.

Since publication of New and Nonofficial Remedies, 1915, and in addition to those previously reported, the following articles have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association for inclusion with "New and Nonofficial Remedies":

Merck and Co.:

Agar Agar Powder, Merck.
Agar Agar Shreds, Merck.
Berberine Hydrochloride, Merck.
Calcium Peroxide, Merck.
Ethyl Salicylate, Merck.
Fluorescein, Merck.
Formic Acid, Merck.
Mercury Cyanide, Merck.
Mercury and Potassium Iodide, Merck.
Mercury Succinimide, Merck.
Morphine Meconate, Merck.
Osmic Acid, Merck.
Sodium Oleate, Merck.
Sodium Peroxide, Merck.
Thiosinamine, Merck.
Urea, Merck.
Zinc Peroxide, Merck.

H. K. Mulford Co.:

Ampuls Emetine Hydrochloride 0.005 gm.
Ampuls Emetine Hydrochloride 0.02 gm.
Ampuls Emetine Hydrochloride 0.04 gm.
Ampuls Mercury Succinimide 0.1 gm.
Ampuls Pituitary Extract ½ c.c.
Ampuls Quinine Dihydrochloride 0.24 gm.
Ampuls Quinine Dihydrochloride 0.5 gm.
Ampuls Quinine and Urea Hydrochloride 1 per cent.
Ampuls Sodium Cacodylate 0.1 gm.
Ampuls Sodium Cacodylate 0.2 gm.
Ampuls Sodium Cacodylate 0.5 gm.
Ampuls Sodium Cacodylate 1 gm.
Purified Tricresol, Mulford.
Scarlatinal Strepto-Serobacterin (Therapeutic).

Powers-Weightman-Rosengarten Co.:

Calcium Peroxide, P. W. R.
Magnesium Peroxide, P. W. R.
Sodium Perborate, P. W. R.
Sodium Peroxide, P. W. R.
Strontium Peroxide, P. W. R.
Zinc Peroxide, P. W. R.

Swans-Myers Co.:

Swan's Staphylococcus Bacterin (No. 37).
Swan's Streptococcus Bacterin (No. 43).
Swan's Typhoid Bacterin (No. 44; Prophylactic).

Cutter Laboratory:

Anti-Pneumococcic Serum, syringes 10 c.c.; Diphtheria Antitoxin Globulin, syringes 2,000, 3,000, 4,000, 5,000 and 10,000 units each; Normal Serum (from the horse), springes 10 c.c.; Tetanus Antitoxin, syringes 10 c.c.

Hoffmann-LaRoche Chemical Works:

Imido, Roche, ampules Imido, Roche.

Standard Oil Co. of California:

Calol Liquid Petrolatum, heavy.

Morgenstern and Co.:

The Council has recognized Morgenstern and Co. as selling agent for Dolomol and the Dolomol preparations in New and Nonofficial Remedies. The Council is assured that these preparations will be marketed in accordance with its rules.

White Chemical Co.:

The Council has recognized the White Chemical Company as selling agent for Apinol. The Council is assured that this preparation will be marketed in accordance with its rules.

Swan's Typhoid Bacterin (No. 44; Prophylactic).—Marketed in packages of three 1 c.c. vials and also in packages of six 1 c.c. vials. Swan-Myers Company, Indianapolis, Ind. (*Jour. A. M. A.*, Nov. 27, 1915, p. 1915.)

Scopolamine Stable, Roche.—An aqueous solution of pure scopolamine hydrobromide protected against decomposition by the addition of 10 per cent of mannite. It has the properties of scopolamine hydrobromide, U. S. P. It is supplied in ampules, each containing 1.2 c.c. (1 c.c. contains 0.0003 gm. scopolamine hydrobromide.) The Hoffmann-LaRoche Chemical Works, New York. (*Jour. A. M. A.*, Sept. 25, 1915, p. 1111.)

Coagulen, Ciba.—An extract said to be prepared from blood-platelets and to contain thromboplastic substance mixed with lactose, 1 gm. representing 20 gm. dried blood. It is said to act as a hemostatic and to be useful in the treatment of certain local and certain internal hemorrhages. Solutions of Coagulen, Ciba, are used locally, intramuscularly and intravenously. A Klipstein and Co., New York. (*Jour. A. M. A.*, Sept. 25, 1915, p. 1111.)

Calol Liquid Petrolatum, Heavy.—A non-proprietary brand of liquid petrolatum, U. S. P., said to be derived from California petroleum and to consist essentially of hydrocarbons of the naphthene series. It is colorless, non-fluorescent and practically odorless and tasteless. Its specific gravity is 0.886 to 0.892 at 15C. Standard Oil Company of California, San Francisco, Cal. (*Jour. A. M. A.*, Sept. 25, 1915, p. 1111.)

# Publisher's Notes

## AGAR IN CHRONIC CONSTIPATION.

As is perhaps generally known to physicians, Agar (sometimes designated Agar-agar), is a Japanese gelatin derived from seaweed. This substance has the natural property of absorbing water readily, and retaining it. It resists the action of intestinal bacteria, as well as that of the enzymes. Its use in the treatment of chronic constipation is based upon the fact that when ingested it passes practically unaltered into the intestine, where it adds to the bulk of the feces and thereby stimulates peristalsis; also it softens hard and dry fecal masses, thus favoring normal evacuation.

Parke, Davis & Co. supply a superior quality of Agar in granular form which is very convenient for use and free from the somewhat unpalatable character of the ordinary commercial product. It is marketed in pound and quarter-pound cartons.

One or two heaping tablespoonfuls, according to individual requirements, taken morning or evening, at meal-time, with milk or cream or mixed with a cereal food, usually produce the desired result.

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## POWERFUL ANTISEPTIC AND DISINFECTANT.

A solution of germicidal soap (McClintock), containing 1:5000 mercuric iodide, the active ingredient, destroys common pus-producing organisms in less than five minutes. Prof. F. G. Novy of the University of Michigan is authority for the statement. He adds that solutions of mercuric chloride 1:1000 require more than fifteen minutes to accomplish the same result.

Germicidal soap (McClintock) is at once a sterilizer, cleanser and lubricant. It is useful for sterilizing hands, instruments, and sites of operation; for lubricating sounds, specula, etc. It is excellent for vaginal douching, as it tends to dissolve pus, blood and mucus, whereas most other germicides coagulate them. It serves well as a disinfectant wash after attendance upon cases of communicable disease; in certain surface lesions associated with fetid discharge; in skin affections of parasitic origin. It is efficacious as a deodorant in offensive hyperidrosis. In short, whenever and wherever a powerful disinfectant and detergent is required, this soap would seem to be indicated.

Germicidal soap (McClintock) is supplied in two strengths, containing, respectively, one per cent and two per cent of mercuric iodide. The stronger soap (two per cent) is marketed in large cakes only; the milder (one per cent) in large and small cakes, in collapsible tubes (a soft soap), and in cylindrical sticks (for surgical use). Parke, Davis & Co. are the manufacturers.

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